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ABSTRACT

This project examined whether there is a lexicon of messages commonly used by vocational rehabilitation (VR) counselors with deaf clients that might be stored digitally on a CD-ROM disk with the eventual purpose of developing a voice-to-sign translation system to facilitate communication between hearing and deaf individuals. Surveys of counselors and reception personnel from 34 VR offices were analyzed, and a set of commonly used messages was identified. Messages were evaluated for length, complexity, and evidence of enabling/disabling language. Ninety-three percent of the total messages (N=1080) identified contained no references to enabling or disabling language. Examination of the remaining 88 messages revealed only three instances of "disabling language". Calculations indicated that it is feasible to create a computer program to translate voice or text input to manual signs. Results suggest the inclusion in such a disk of 125 commonly used messages and 120 individually signed words. Development of computer strategies to implement recommendations is discussed. (Contains 16 references.) (DB)

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ED 447 610

Language Patterns used by Vocational Rehabilitation staff to Communicate with Deaf Clients: Enabling or Disabling?

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Abstract

Communication problems exist between Deaf individuals and staff at some Vocational Rehabilitation (VR) offices because not enough staff is fluent in sign language. With the advent of continuous voice input and CD-ROM technology, it was conceivable that a voice-to-sign translation system could be developed to facilitate communication between hearing and deaf individuals. This project was designed to determine if there was a lexicon of commonly-used messages which could be stored digitally on a CD-ROM disk. Surveys from VR staff in nine states were analyzed. A set of commonly-used messages was identified. Messages were evaluated for length, complexity and evidence of enabling/disabling language. Results indicate a need to include individual signs to allow creation of new messages and a way to convey concepts not included as signs on the CD-ROM. The development of computer strategies to implement these recommended features is discussed.

One of the topics proposed by the U.S. Department of Education in 1997 was integration of new voice input technology with CD-ROM technology to produce a voice-to -manual sign translation system to facilitate communication between vocational rehabilitation professionals and deaf clients who use sign language (DOE, 1997). Deaf youth and adults are typically underemployed or unemployed because of communication barriers and other variables (Allen, Rawlings, & Shlldroth, 1989). Communication problems exist between Deaf individuals and staff at some Vocational Rehabilitation (VR) offices because not enough staff is fluent in sign language (Shalls, 1997; Ward, 1997). A District Director of the Division of Vocational Rehabilitation in the state of Florida indicated that in his nine county area, only three counties had any personnel who could sign, and only one out of six people had national certification in Interpreting (Shalls, 1997). A contract was awarded to produce a prototype voice-to-sign translation system (Loeding & Abrahams, 1997). The translation system is not intended to replace the use of interpreters or diminish the need for Vocational Rehabilitation (VR) Counselors who are fluent signers; it is intended to be used by non-signing staff members, for brief communicative interactions when interpreters are not available.

The National Symposium for Educational Applications of Technology

for Deaf Students concluded that interactive multimedia applications (such as CD-ROM based products) clearly support positive educational outcomes for those who are Deaf (Stuckless & Carroll, 1992). In addition, voice input or voice-to-text technology has been steadily improving and accurate continuous voice input is becoming more of a reality (Johnson & Jensema, 1997). However, to display videotape segments of manual signs on screen requires that the videotapes be digitized and saved to disk and storage of digitized manual signs is memory-intensive. Storing a large number of signs on floppy disks for use by a translation system is not practical. However, with the advent of CD-ROM technology, it was conceivable that a CD-ROM disk could be used to store a sufficient number of digitized manual signs for this project. CD-ROM technology greatly increased storage capacity from 1.4 meg on a floppy disk to 650 megabytes per disk. A computer survey conducted recently indicated that CD-ROM drives were already present in 46% of the VR offices contacted (Loeding & Abrahams, 1998). In addition, some offices without CD-ROM drives indicated that they expected to receive new computers with CD-ROM drives very soon.

Recently, there has been interest in examining the language used by rehabilitation professionals (Peirce, 1998). Primarily, researchers have examined whether professionals still use "disabling language" and explored the effects disabling language may have on attitudes towards people with

disabilities. Patterson (1988) defined "disabling language" as language that perpetuates myths and stereotypes about people with disabilities, makes use of the disability as a noun or which uses outdated terminology when referring to people with disabilities. This would include phrases such as "cerebral palsy victim", "patient", "disabled people", and "person confined to a wheelchair". Enabling language is also referred to as "People First" terminology because the speaker refers to the person before mentioning the disability, such as "I work with people with disabilities". Putting the emphasis on "the person" first implies that each person has a number of characteristics, one of which is a disability (Kailes, 1985). Ability magazine, which claims to be "the voice of fifty million Americans with disabilities", uses People First terms (http://www.abilitymagazine.com). Clearly, professionals need to use language or terms preferred by people with disabilities because they are most directly affected by those terms.

The interest in studying the language of rehabilitation professionals for this study was more extensive. A crucial component of the process of assessing the feasibility and designing a new assistive device is involvement and input from the potential users of the device (Gray, Quatrano, Lieberman, 1998). The potential users of the proposed computer program to translate voice or text input into manual signs are vocational rehabilitation staff and their deaf clients. Therefore, to see if the program was feasible, it was

necessary to gather input to determine if there was a lexicon of commonly used messages which could be filmed, digitized and which could fit on a single CD-ROM disk. The following research questions were generated:

1. Is there a set of commonly-used messages which VR staff use with clients who are deaf?
2. To what extent do the messages contain "disabling language" and "enabling language"?
3. Is there a need to include additional, individual signs that could be combined in unique ways?

   If so, how many could be included on a CD-ROM disk, along with the set of commonly-used messages?
4. Is there a need for the computer program to also have the capability to convey unique vocabulary concepts that were not anticipated or included on the CD-ROM disk? If so, how could unique concepts be conveyed?

Purpose

The main purpose of this study was to see if there was a common body of words, phrases and/or sentences used in vocational rehabilitation settings. A secondary purpose was to describe the extent to which VR Counselors and staff were using enabling language. To accomplish this purpose, two surveys were created, distributed and analyzed.

Method

A modified ecological approach was used to design the vocabulary surveys. An ecological approach usually includes more than one environment where communication occurs; however this study focused on only one. Within the VR environment, different activities that involve communication between VR staff and clients were identified. Mirenda (1985) and Reichle, York, & Sigafoos (1991) describe how an ecological approach can be used to collect vocabulary used by persons who are not literate. Their approach involves using a person other than the subject to conduct detailed on-site analyses of communication requirements. Since our participants are literate, they served as their own informants. Within the role of receptionist, nine areas of possible conversation were identified: setting up/canceling appointments, filling out paperwork, giving directions, answering basic questions about VR services and the ADA, explaining that a Counselor is out of the office, asking if person wants to wait or leave a message, explaining where bathroom is, and calming a person down. Within the role of Vocational Rehabilitation Counselor, 15 areas of possible conversation were identified: prospective client arrives at office, explaining vocational rehabilitation services, prospective client returns to office with their information, initial "in-take" interview, explaining vocational evaluation, explaining client's vocational evaluation results, discussing preferred

conversational mode, giving information/asking questions about job possibilities, talking to employers with a deaf person present, talking to a client about a problem, explaining the ADA, exploring how the client/family will contribute to overall plan, explaining that a different counselor is being assigned, explaining that VR services are being terminated, and constructing a PASS plan with client. In addition, a miscellaneous category of "other phrases you use" was included for both the VR staff and VR Counselor so critical messages would not be accidentally omitted. This raised the total number of categories to 10 for the VR staff and 16 for the VR Counselors.

Instruments

Two surveys were prepared; a four-page survey for VR Counselors to complete and a two-page survey for the staff who work in the reception area to complete. Each survey asked for the name and job title of the person completing the survey, the location, and phone number of the VR office. The introductory paragraph described the purpose of the survey and contained directions for completion of the survey. Surveys for reception area staff contained nine questions, such as "Do you ever have to set up and cancel appointments for clients?". For each question, there was a place for the staff member to indicate what words s/he would need to use in that situation. Surveys for the VR Counselors listed each of the fifteen areas of conversation described above with a space for people to write five or more

entire messages for each area. Both surveys included a space for staff to indicate other messages that didn't fit any of the categories on the survey. It was anticipated that some messages would not be appropriate to convey using a computer system, but to avoid restriction of the collection of messages, this was not mentioned on the survey.

Participants

In order to collect vocabulary, a sample of 300 VR offices in nine states was identified and called to see if they would participate in our survey research. Two offices declined due to lack of available time. Two surveys were faxed to each remaining VR office; one for VR Counselor(s) to complete and one for staff who work in the reception area. Staff was asked to write down up to five messages for each of the identified areas and to add any other critical messages they could identify. Thirty-four surveys were returned by fax for a return rate of 12%.

Operational Definitions

For the purposes of this study, the term "disabling language" was defined as the use of a term as a noun, not as a characteristic (the disabled, the Deaf, the Blind, the handicapped) or the use of "disabled" or "handicapped" as an adjective preceding a noun (disabled people,

handicapped clients) or the use of outdated terminology such as "handicap" instead of impairment or disability (Patterson, 1988). The definition of disabling language for this study did not include references to "deaf person/employee" because the majority of Deaf people are not offended by this term (Moore & Levitan, 1993). "Enabling language" was defined as referring to the person first and the disability second (e.g. person with disability, client with learning disabilities) (Kailes, 1985).

Results and Discussion

Data Analysis

The messages from each survey were entered into a computer database and analyzed for similarities and differences. The total number of messages, repeated messages, unique messages, messages using disabling language, and messages using enabling language were calculated separately for VR Counselors and for VR staff, and each area of conversation.

Messages Generated By VR Counselors

1165 total messages were collected in the 16 different areas of conversation for the VR Counselor. 11,180 different words or acronyms were used. Table 1 shows the number of messages collected for each area. The category generating the most responses was "initial in-take" interview (144 messages), while the least number of messages was generated by the area

"constructing a PASS plan" (21 messages). There were numerous incidences where the person filling out the survey commented that it was inappropriate for any comments to be made in that area without the interpreter, as anticipated. Therefore, Table 1 also contains a column indicating the number of people who did not include any phrases for a particular area because they commented on the need for an interpreter to discuss that area.

Ninety-three percent of the messages (1080) contained no references to enabling or disabling language. Examination of the remaining eighty-eight messages revealed only 3 instances of "disabling language" (3.4%). One counselor referred to "disabled people", another referred to "handicap" twice. In contrast, there were 85 instances of People First and "enabling language" (96.6%). This indicates that these VR Counselors were using enabling language almost every time it is appropriate to do so.

VR Counselors generated 900 unique messages. VR Counselors submitted overlapping messages fairly often (12.3% of the time). An example would be the concept of "asking the person to explain who referred them to VR". This question appeared on six surveys using slightly different wording. 144 messages were duplicated by at least one other Counselor, as can be seen in Table 2. In determining if a message was duplicated or not, a strict definition was used. Only messages in the same category were compared.

Anecdotally, project staff noticed that messages were also duplicated from one category to the next, which, if included, would have raised the number of duplicated messages. In addition, if the concept was conveyed in a statement format by one counselor and in a question format by another counselor, they were **not** judged to be the same message. Asking a client a question was considered to be significantly different from telling them something (e.g., I will send you for work evaluation vs. Do you want to go to work evaluation?). These repeated messages would be excellent candidates for inclusion in the CD-ROM, as complete signed messages instead of messages where each sign would be individually generated. In this way, the most commonly used phrases would be produced in the most fluent and smooth manner.

Table 1. Number of Messages generated by VR Counselors and Indicated Need for Interpreter

Survey area	# saying interpreter was needed	# of messages collected
Prospective client's arrival	0	109
Explanation of VR Services	1	118
Prospective client returns with information	0	76
Initial In-Take Interview	0	144
Explaining Vocational Evaluation	0	84
Explaining Client's results	2	81
Discussing Preferred Communication Mode	1	94
Giving info on job possibilities	2	74
Talking to Employer with Client	3	54
Talking to Client re problem	2	65
Explaining ADA	2	47

Exploring how family will contribute to overall plan	1	25
Explaining a change in Counselors	1	58
Explaining termination of services	1	76
Constructing a PASS plan	2	21
Other	2	39
Total Number of Messages	n/a	1165

Table 2. Number of repeated, enabling, and unique messages generated by VR Counselors

Survey Area	# of repeated messages	# messages with enabling language	# of unique messages
Prospective client's arrival	20	4	84
Explanation of VR services	17	28	87
Prospective client returns with information	7	9	66
Initial in-take interview	23	13	88
Explaining Vocational Evaluation	11	3	64
Explaining client's results	9	0	62
Discussing preferred communication mode	18	1	66
Giving info on job possibilities	6	0	68
Talking to employer with client	6	5	39
Talking to client re problem	6	0	59

Explaining ADA	4	5	38
Exploring how family will contribute to overall plan	3	5	22
Explaining a change in Counselors	4	3	31
Explaining termination of services	10	2	66
Constructing a PASS plan	0	1	21
Other	0	7	39
Total	144	85	900

Messages Generated by Receptionists

Table 3 shows the number of messages and individual words collected for each area. The asterisks indicate that one or more of the respondents indicated that they would need to be able to communicate names of particular people and specific times of the day.

368 total messages were collected in the nine different areas of conversation for the VR Technician/Receptionist, plus the miscellaneous area. In addition, 141 words or terms were submitted. The percentages of receptionists reporting that they communicate in a particular area are as follows:

explaining a person is out of the office	100%
explaining where the bathroom is	85.2%
making appointments	70.4%
helping client fill out paperwork	63%
giving directions	59.3%
asking if they want to wait or leave a message	59.3%
calming a person down	55.6%
answering basic questions about VR services	41%
answering basic questions about the ADA	22.2%

The category everyone reported communicating about generated the most

responses (75) ("explaining someone is out of the office"). A large percentage of receptionists reported no need to communicate about the ADA (77.8%); this area generated the least number of messages (8). Out of 368 total messages, only fifteen contained enabling or disabling language. There were only four instances of "disabling language" in the individual terms or complete messages (27%). One person indicated use of terms such as "the Department of (the) Visually Handicapped" and the "School for the Deaf and Blind". Another person's message "We help the disabled" used "disabled" as a noun. A fourth person indicated that there were "Deaf Specialists" in their office. This message is confusing because it could mean her office has Deaf people who are Specialists or Specialists who work with Deaf people. On a positive note, there were approximately three times more examples of "enabling language" or "People First" terms (11) (73.3%). This indicates that the VR staff in this study, were using enabling language the majority of the time it was appropriate to do to, although not as often as the VR Counselors did.

Table 4 contains the number of messages that were repeated by more than one receptionist and the number of unique messages for each of the ten areas. The total number of repeated messages was 66. These messages could be considered for inclusion in the Commonly Used Messages category on the CD-ROM that will be signed in their entirety. The messages of

receptionists contained a higher percentage of repeated messages (23.9%) than those of the VR Counselors (12.3%).

Table 3. Number of messages and individual words collected from VR Receptionists.

Area	# of messages collected	# of messages with disabling language	# of individual words suggested
Appointments	50	0	19*
Paperwork	31	0	10
Giving directions	41	2	14
Answering basic VR questions	19	2	15
Answering basic ADA questions	8	0	10
Explaining person is out of office	75	0	12*
Asking if person wants to wait or leave a message	60	0	0
Directions to bathroom	28	0	14
Calming a person down	41	0	12
Other	16	0	35*
Total	368	4	141*

* = 1+ person indicated a need to communicate names of people and specific times of day.

Table 4. Number of repeated and unique messages generated by VR Receptionists

Area	# repeated messages	# of unique messages
Appointments	10	23
Paperwork	7	14
Giving directions	3	35
Answering basic VR questions	2	11
Answering basic ADA questions	2	8
Explaining person is out of office	20	16
Asking if person wants to wait or leave a message	13	14
Directions to bathroom	20	23
Calming a person down	9	18
Other	2	4
Total	88	166

Need for Unique Vocabulary

Examination of the surveys revealed a need to convey unique vocabulary. People indicated that they need to give clients directions that include the use of proper names for streets, cities, towns and buildings. They also need to use names of people in conversation. The manual signs used for large cities such as New York and Chicago would be recognized throughout the country; however signs for the majority of cities and towns would not be recognized out of a particular state. Similarly, manual signs for names of people and streets differ from place to place.

There are limited options of how to convey unique vocabulary; a) in text or b) spelling the English word using the manual alphabet called fingerspelling. Just as parents sometimes resort to spelling words in front of children, Deaf people have a visual alphabet called fingerspelling, available for them to use to convey concepts for which they do not know a corresponding sign. Fingerspelling can be used for a person's proper name or the name of a place, if the name sign is not known. By digitizing the manual alphabet and linking the start and end frame numbers of each letter to the computer database, the computer program has the ability to fingerspell words for which no sign was digitized. Fingerspelling a word does not guarantee that the Deaf person will understand the concept. Note that it is the parent's hope that by spelling a word the child will not understand what is

being referred to. Generally, the more fingerspelling contained in a message, the less a person can be sure that the Deaf person understood the intent of the message. It may be necessary for the computer program to keep track of how many times the program had to resort to fingerspelling. Further research may indicate that if the program has fingerspelled a certain proportion of words, it is quite likely that the Deaf person is not understanding. When this threshhold is reached, the program could display a message that notifies the hearing person and suggests that an interpreter be hired for this situation. It is also anticipated that there will be instances where two fingerspelled words will be adjacent to each other, such as spelling a person's first and last name. To assist the Deaf person in distinguishing one spelled word from the next spelled word, the computer program should include a provision that adds a 1/2 second pause in between the two words.

Length and Grammatical Complexity of VR Messages

Many of the messages written on the surveys were lengthy (over 6 words per utterance). For example, the average length of a message in two subsets of fifteen messages was 7.8 words. Many messages contained complex English vocabulary, acronyms and structures (such as "maintain" vs "keep" and "verify" vs. "prove/show", passive voice constructions, and compound sentences). Project staff familiar with deafness believe that most Deaf clients would have a hard time comprehending these messages when

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spoken or written.

In contrast, several counselors wrote the messages in ASL/semi-ASL glosses. An effort was made to choose wording for the Commonly-Used Phrase list that would be easiest for the largest number of Deaf clients to understand, yet still sound familiar to a VR Counselor who was not familiar with deafness. Guidelines for modifying English sentences could be used to enhance message comprehension by Deaf clients. This would include examination and modification of sentence length, vocabulary and syntax. These messages could then be included in a computer drop-down menu list of "Commonly-used Phrases" from which VR Counselors could choose. Then, the VR Counselors might be less likely to generate the messages themselves and produce a lengthy, complex message that might be more difficult for Deaf clients to understand.

Calculations for the CD-ROM disk

The computer program and buffer for the proposed voice-to-sign translation system is estimated to require 20 megabytes of storage space on a CD-ROM disk. Based on calculations from a previous project (Loeding & Abrahams, 1995), on the average, each manual sign takes less than two seconds to produce and occupies approximately 550 Kb of space for one-quarter size screen display at fifteen frames per second. Using this metric, a CD-ROM disk (630 meg of storage remaining) could contain 1145 individual

signs or a combination of signed sentences and fewer individual signs.

In order to have the ability to fingerspell words that are not in the signed database, each letter of the alphabet needs to be digitized. It would be important to also digitize at least 30 numbers. It is estimated that fingerspelling and numbers would require 14 megabytes of space, leaving 616 megabytes free. To estimate whether or not all of the commonly used messages of the VR Counselors and Receptionists would fit into the remaining space, the 210 messages were multiplied by the average number of signs per message (7.8) and multiplied by the size of each individual sign file (.55 meg). This yielded a total of 900 megabytes needed to store the digitized messages. This exceeded the space available on a single CD-ROM disk.

Options include switching to a DVD disk, reducing the data rate and sacrificing some video quality or reducing the number of signed sentences. DVD technology increases storage to 9.5 gigabytes per disk; however, at this time, it is hard to predict how quickly DVD drives will be purchased by VR offices. All of the 210 commonly used messages, the computer program, fingerspelling, numbers and over 3000 individual signs would fit on a single DVD disk; however, the utility of the system might be greatly reduced if DVD drives do not proliferate. In the computer survey conducted by Loeding and Abrahams (1998), no VR office indicated that they had a DVD drive yet or

that they were expecting to switch to DVD drives in the future.

If the data rate was reduced, all of the commonly used sentences could be included on a single CD-ROM disk with a slight decrease in sign intelligibility. A third possibility is to reduce the number of commonly used phrases. For example, if the 210 messages were reduced to 125 messages, these messages could be stored on a CD-ROM disk using 550 megabytes. The remaining 66 megabytes on the CD-ROM disk could be used to store individual signs. Using the same formula, it is estimated that an additional 120 signs could be stored on the same disk. If these signs were carefully chosen to augment the signs already available from the 125 signed sentences, it is possible that the CD-ROM could contain over 1000 signs which could be combined in numerous ways.

Conclusions

With respect to the primary purpose of this study, it was concluded that it was feasible to create a computer program to translate voice or text input to manual signs because there was a lexicon of commonly-used messages which could be filmed, digitized and which could fit on a single CD-ROM disk. Survey results from this study indicate that VR staff tends to discuss a common set of topics with each client. This research also indicated that there is a need to include additional individual signs that could be combined in unique ways. Calculations from this study show that if 125

commonly used messages are included, there will be space enough to include 120 individual signed-words on a CD-ROM disk. Further research is needed to select the most important 125 messages from the list of repeated messages collected in this study. Importance could be defined in several ways: the most frequently used messages or the messages that were least understood when individual signs were parsed together. In addition, the percentage of VR staff reporting a need to communicate in particular areas should be examined to determine relative weights of importance.

In the event that DVD drives become prevalent, the number of messages and individual signs that could be included on one disk would increase dramatically and greatly reduce the need to be selective about inclusion of certain messages. For comparison purposes, 989 signed messages, averaging 8 signs per message would fit on one DVD disk. This would permit 41 messages in each of the 24 areas of conversation included on the surveys used in this study.

This research determined that there is also a need for the computer program to have the capability to convey unique vocabulary items not included on the CD-ROM. This could be accomplished by filming and digitizing the signing of individual letters and constructing a computer program that automatically branches to fingerspelling for unique words. The video segment corresponding to each of the letters in the word could be

parsed together and displayed on the screen.

With respect to the study's secondary purpose, the preponderance of messages analyzed in this study referring to disability contained enabling language. This indicates that VR staff is spontaneously using enabling language a majority of the time. VR Receptionists are also using enabling language more often than disabling language. Building on the conclusions of Peirce (1998), if the use of inappropriate language hinders the advancement of people with disabilities, this implies that the language of VR staff is now facilitating the attainment of their clients' goals.

Limitations of the Study

The generalizability of the conclusions of this study is limited to the nine states from which data were collected. It is possible that the VR staff in the remaining states have other topics to discuss or use additional vocabulary. It is also limited to conversations between VR staff and clients who are Deaf. Since the samples of language were gathered by asking VR staff to recall conversations and write down the things they say to clients who are Deaf, it is possible that VR staff use different vocabulary and sentence structures when engaged in actual conversations. Any future changes in the VR regulations or policies might also cause a change in the vocabulary used with clients.

Implications for Future Research

This study focused on collecting input from people who would be inputting speech or text into the computer program. Future research should use focus groups to elicit input on the feasibility and program design from the people who would be receiving this new type of communication; individuals who are deaf who use sign language to communicate. Focus groups could also include employers who have Deaf employees to see if they judge this computer translation program to be beneficial and realistic.

Comments made on a number of surveys indicated that, as anticipated, there are some topics or situations that require the use of an interpreter, i.e., professionals indicated that a computer translation system would not be appropriate. Therefore, any computer-based translator should include guidelines for proper use and cautions regarding inappropriate uses. Opinions on when and if a computer translation system is appropriate should also be gathered from individuals who are Deaf. Future research should more fully explore and prepare appropriate guidelines for use so users understand which situations require the use of an interpreter. It is possible that the translation program could include a "button" for the Deaf person to click to interrupt the communication to indicate a need for an interpreter prior to continuing the conversation. Another option would be to have the program automatically ask the Deaf person if they wanted to continue using the

translation program or switch to an interpreter after the program had translated a certain number of messages. The program could even include an automatic shut-down feature if the Deaf person indicated a need for an interpreter to prevent misuse of the program.

Since many of the messages composed by Counselors unfamiliar with Deaf individuals were judged to be difficult for Deaf people to understand, future research could also quantify the number of messages with complex vocabulary and/or grammatical structures. When a voice-to-sign translator is available, a study could investigate whether conversion to English-based signs improved comprehension (compared to written messages). For comparison purposes, commonly-used messages could be translated into ASL glosses also. Using a voice-to-sign translator, a study could investigate whether comprehension was aided by conversion to either English-based signs or ASL glosses when compared to written messages. It would also be important to determine if Deaf users desired the mixture of presenting novel utterances in English-based signs, while commonly used messages were presented in ASL or whether they preferred uniform presentation of all messages.

Previous research has demonstrated that assessing assistive technology devices in dynamic conditions (authentic) is superior to static situations (experimental) (Gray et al, 1998). Therefore, the effectiveness of

such a prototype should be studied in a realistic setting, using real-life messages and actual VR staff and clients. Such a study could yield valuable information regarding the ease of use and level of satisfaction with the prototype from the perspectives of the intended users with and without disabilities.

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Brief Biographical Sketch

Barbara Loeding is an Associate Professor in Special Education at the University of South Florida, Lakeland, Florida. She has served as Principal Investigator and/or Project Director for several research projects in the area of sign language and assessment of individuals who are deaf, blind or have a physical impairment. Her background experience includes over twenty years in providing education and services to individuals with disabilities as a speech-language pathologist, sign language instructor, and sign interpreter. After receiving a grant from the US Department of Education, she received an award for developing the Generalizable Interpersonal Vocational Skills Assessment (Sign language version) from the John Hopkins National Search for Computer Solutions for Assisting Persons with Disabilities. Two SBIR contracts were awarded for continued development of this product, now called Self-Help Interpersonal Skills Assessment. In addition, she has taught courses and in-service workshops to personnel responsible for the education of children and adults with disabilities, including a course dealing with computer applications in special education.